

Prevention of Post Traumatic Stress Disorder among Military Health Care Workers: A Systematic Review

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Author Note

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government.

Abstract

Studies indicate that Posttraumatic Stress Disorder (PTSD) is not uncommon among medical personnel serving in the military and that its prevention remains a significant challenge. While extensive PTSD research findings exist that are generalizable to the military, dedicated research specific to its at-risk population of medical workers is less common. The purpose of this review is to perform a systematic search for the most effective strategies in the prevention of PTSD and consider their applicability to the military healthcare provider. Comprehensive electronic search was performed utilizing MEDLINE, Cochrane Database, PubMed, CINAHL (EBSCO), Health and Wellness Resource Center, Nursing and Allied Health Source, Applied Social Sciences Index (CSA), PsycARTICLES (APA), and PAIS International (CSA). Significant variation exists among PTSD preventive strategies in effectiveness and in applicability to military healthcare workers. Strategies such as multiple early interventions, psychological debriefing, pre-deployment training and psychoeducation lack current evidence for efficacy in the prevention of PTSD. PTSD preventive strategies should favor therapy that identifies the traumatic event, with long-term outpatient therapy more effective than short-term inpatient. Vigorous physical exercise and unit cohesion are significantly associated with decreased odds of PTSD symptom development among military personnel. Awareness of significant risk factors may improve preventive outcomes by

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enabling earlier intervention, and insights on resiliency may further optimize effective PTSD preventive strategies. Modified Prolonged Exposure (PE) therapy may be an effective and practical early intervention with expanded applicability to military operation settings.

Keywords: Posttraumatic Stress Disorder, PTSD Prevention, Military Healthcare Worker

Introduction

Given the risk for PTSD among military members deployed to combat settings, military health care providers are trained in its diagnosis and treatment. Despite this training, providers themselves are also susceptible to PTSD. Military medical personnel serving within active combat zones may face the dual challenge of treating severely injured service members and being personally subjected to life threat, and PTSD is not uncommon among them (Maguen et al., 2008). One study found that between 4.7 and 11.9 percent of military health care workers returning from recent deployments to combat settings met criteria for probable PTSD (Grieger, Kolkow, Spira, & Morse, 2007). Prospective longitudinal studies of PTSD among 355 military healthcare workers who cared for victims of an air disaster revealed a PTSD prevalence that ranged between 7.3 to 13.5 percent at the end of the 18 month study (Epstein, Fullerton, & Ursano, 1998).

Despite the prevalence of PTSD in studies among military health care workers, experts in the field who have examined emergency response worker PTSD note that there is limited literature examining early intervention methods, and that no particular model for this population of service workers has demonstrated clear efficacy (Eriksson, Foy, Larson, & Litz, 2004). With the added responsibility of military service, health care workers have the potential to face varied and perhaps additional stressors given today's fast-paced operational tempo in which war deployments and trauma exposure are not uncommon. While emphasis is often placed on PTSD diagnosis, treatment or prevention among nonmedical personnel, the purpose for this paper is to perform a review of peer-reviewed and evidence-based literature for post-traumatic stress disorder prevention strategies and consider their applicability to military health care providers. The aim is to address the research question "What are the best available practices and strategies to prevent PTSD among military health care providers?" A review of the literature with focus on finding effective evidenced-based prevention strategies potentially applicable to military medical providers would be invaluable at lending to the prevention of PTSD among such an at risk group of workers.

Methods

A comprehensive search was performed of MEDLINE, Cochrane Database, Pub Med, CINAHL (EBSCO), Health and Wellness Resource Center, Nursing and Allied Health Source, Applied social sciences index (Cambridge Scientific Abstracts), PsycARTICLES (APA), and PAIS International (Cambridge Scientific Abstracts) using the initial broad subject search "posttraumatic stress disorder or PTSD" and "prevention" for peer-reviewed and evidence based articles published between 1998 to 2011.

Inclusion criteria held that the study involve preventive strategies with either direct or potential applicability to the military healthcare worker. Given their duel role as service

members and as healthcare providers, studies involving both non-healthcare military service members, and non-military healthcare and emergency response workers were also included in order to maximize the capture of applicable PTSD preventive strategies. Papers not published in English were excluded from the review if no translation was available.

Results

While numerous strategies aimed at PTSD prevention exist, not all are equally effective. Many of these strategies fall into the realm of “psychoeducation.” Psychoeducation is defined as information given to individuals about the nature of stress symptoms, both posttraumatic and other, and what to do about them. The aim of psychoeducation is to mitigate the effects of such exposure (Krupnick & Green, 2008). Although vast resources have been used to develop such programs, few studies examine the impact that educational briefings and stress control teaching has on incidence and long-term PTSD prevalence (Hourani, Council, Hubal, & Strange, 2011). Despite the common employment of psychoeducation as an intervention with the aim to prevent PTSD, researchers note a lack of clear evidence for its efficacy (Krupnick & Green, 2008; Hourani et al., 2011; Wessely et al., 2008). Among military members who received psychoeducation there was no significant difference among PTSD checklist scores when adjusting for all demographic variables (Greenberg, Langston, Fear, Jones, & Wessely, 2008). Certain PTSD preventive strategies that have generally been thought beneficial in this area may instead be ineffective, and some perhaps even harmful. For example, the widely employed population based strategy of military personnel pre-deployment training was found to be ineffective at PTSD prevention (Renshaw, 2011). In addition, Sijbrandij (2010) found that multiple session early psychological interventions after trauma do not prevent PTSD (Sijbrandij, 2010). In fact, trends exist for increased self-report of PTSD symptoms at 3 to 6 month follow-up studies following multiple interventions that occurred within 3 months after the traumatic event, and one trial reported that at one year there was a significantly increased risk of PTSD for those who underwent a single session psychological debriefing (Roberts, Kitchiner, Kenardy, & Bisson, 2009; Rose, Bisson, Churchill, & Wessely, 2002). Might those members be more attuned to the signs of PTSD and thus more likely to seek help/report to professionals? Although that seems possible it was not reported or concluded in the findings.

Researchers who report a general lack of evidence regarding the efficacy of psychoeducation have conjectured what good programs should resemble. They agree that programs that promote social support, facilitate appropriate help-seeking, and reduce stigma of stress reactions can foster improved coping and adaptation; and that fostering resilience, if able to be taught, would be useful (Krupnick & Green, 2008).

Other strategies show promise in regards to PTSD prevention. Research conducted on military personnel, not specific to medical workers, suggests that vigorous physical exercise and unit cohesion are significantly associated with decreased odds of PTSD symptoms (Leardmann et al., 2011; Brailey, Vasterling, Proctor, Constane, & Friedman, 2007). Researchers who studied over 700 Air Force medical personnel provided further evidence that unit cohesion serves as a protective buffer against PTSD symptom development, regardless of level of stress exposure (Dickstein et al., 2010).

Compared to short-term inpatient therapy, extended outpatient therapy after a significant traumatic event seems to be more effective (Tecic et al., 2011). When comparing target population based approaches, a collaborative care model appears more effective than a cognitive behavioral therapy (CBT) approach—therapy focusing on patterns of thinking and underlying beliefs that are maladaptive with emphasis on positive behavioral changes; and dissemination of a collaborative care broad reach prevention strategy may result in a 9.5 fold greater cumulative reduction in the incidence of PTSD compared to a CBT approach (Zatzick, Koepsell, & Rivara, 2009). Collaborative care models for PTSD involve symptom monitoring of those exposed to a traumatic event with subsequent case-manager adjustment and coordination of level of care (Feldner, Monson, & Friedman, 2007). While not specific to military medical workers or to preventive outcome measurement, it is relevant to note that one study involving the universal screening of over 4000 active duty service members with subsequent care facilitation where indicated concluded that the collaborative care approach is feasible in military primary care settings (Engle et al., 2008).

Also promising is the notion of identifying a causal event. The identification of a causal traumatic event may make prevention efforts for PTSD more effective and feasible than for other psychological disorders, and such interventions can be targeted at traumatized individuals who are beginning to show signs of acute stress disorder with the goal of preventing chronic PTSD (Sones, Thorp, & Raskind, 2011).

Early findings among pilot studies that implement both early outpatient therapy and the identification of a causal event have lead to the study of Prolonged Exposure (PE) therapy as an intervention that may be beneficial in the prevention of chronic PTSD, particularly among military settings. Prolonged Exposure is typically delivered in weekly 60 to 90 minute individual sessions over 10 to 12 weeks in specialty mental health clinics. Recognizing that this time intensive model is not always possible for active-duty military members often working long hours in austere settings, researchers studied a modified version of PE and cognitive processing designed for use within primary care settings instead of mental health clinics. Military service members diagnosed with PTSD were given a “Confronting Uncomfortable Memories” activity work book on the first 30 minute appointment designed to be completed at home and carried back for follow-up appointments. As part of this task, service members were required to write a first-person detailed narrative of the deployment event associated with the greatest level of current stress and preoccupation, including recollection of feelings, physical reactions, and personal thoughts. They were then asked to read the trauma narrative for at least 30 minutes each day and complete subjective unit of distress (SUD) ratings for self-monitoring of emotional reactivity. Fifty percent of those completing treatment no longer met criteria for PTSD at the 1-month follow-up assessment across four different outcome measures for PTSD—the PTSD Symptom Scale, Interview Version; the PTSD Checklist—Military Version; the Patient Health Questionnaire-9, and the Behavioral Health Measure ($p < 0.05$ for all) (Cigrang et al., 2011).

The concept of personal resilience traits that may be preventive for PTSD is often mentioned in the literature. Resilience can be defined as an ability to recover from negative and high stress experiences and ultimately find meaning in adverse situations through response flexibility in the face of situational demands that are ever-changing (Maguen et al.,

2008). More simply defined, resilience reflects an individual's ability to maintain relative stability in terms of mental function throughout the course of events (Bonanno, 2004). Being in a relationship, having fewer psychosocial difficulties, greater perceptions of purpose/control, and family support were significantly associated with resiliency among soldiers surveyed after return from combat deployments (Southwick, & Pietrzak, 2011). Among military medical personnel, correlation was found for two resiliency factors as protective for PTSD symptom development prior to deployment to combat environments: personal trait resilience, with positive affect the most strongly associated resiliency factor; and the presence of positive military experiences. However, the authors note that risk factors were more robust at predicting PTSD symptoms than were resiliency factors at predicting absence of PTSD symptoms (Maguen et al., 2008). Increase in resilience has been associated with extroverted and conscientious traits, and this correlation was found to be stronger among members of ethnic minority populations than for Caucasian groups (Campbell-Sills, Cohan, & Stein, 2006). Lower resilience scores have been found among individuals with lower levels of income and education, and individuals with history of childhood maltreatment (Campbell-Sills, Forde, & Stein, 2009).

Discussion

The aim of this review was to discern and discuss the best available practices and strategies for PTSD prevention among military health care providers. As anticipated, the majority of collective research regarding PTSD prevention is not specific to health care providers who are in the military, but instead is largely focused on either nonmedical patient populations, military-only populations, or healthcare-only populations. Valuable insight and understanding were gained from this literature review that may be applicable to PTSD prevention among military health care providers.

Conclusions and implications from this review are multifaceted. Certain strategies typically thought to be effective, such as multiple early interventions or pre-deployment training for example, do not seem to be effective. PTSD preventive strategies for military health care workers facing a significant traumatic event should favor therapy that aims to identify that event throughout the scope of long-term outpatient therapy as opposed to multiple session short-term early interventions.

Awareness of significant risk factors may enhance early intervention efforts and improve preventive outcomes. Extensive research has been conducted in search for reliable factors associated with increased odds for PTSD. The large majority of studies lack at minimum longitudinal cohort design and are rarely specific to the military medical worker, and therefore conclusions of association are more common than those that reliably conclude relative risk and serve as predictors for PTSD development. One exception is the prospective longitudinal cohort study by Epstein et al. (1998) which followed 355 military medical providers up to 18 months after having cared for the mass casualty victims of a large-scale air disaster; concluding that lower levels of education, exposure to grotesque burn injuries, stressful life events following exposure, and feelings of numbness following exposure are useful predictors of subsequent development of PTSD (Epstein et al., 1998). Another longitudinal prospective cohort study, not specific to medical workers but involving over 23,500 U.S. military personnel from among the Army, Navy, Marine Corps, and Air force

who had deployed in support of the conflicts in Iraq and Afghanistan, concluded that those with a history of one or more mental health disorders during baseline screening conducted between 2001–2003 had a statistically significant 2.5 times greater relative risk, and those with history of deployment-related personal injury while only a slight increase, were also statistically at greater relative risk of screening positive for PTSD in at least one follow-up screening conducted in either 2004–2006 or in 2007–2008 (Sandweiss, 2011). Cross-sectional studies that exclusively involve military medical workers have cited pre-deployment stressors and lifetime trauma exposure as factors associated with increased odds for PTSD symptoms prior to deployment; and one that administered anonymous surveys to military health care providers who had deployed to Iraq or Afghanistan found that direct threat exposure (frequent personal engagement in direct combat or being fired upon by opposition forces), perceived threat (frequent concern regarding being in danger of personal harm), and non-Caucasian race were associated with 17, 8.9, and 9.2 times greater odds, respectively, of meeting criteria for probable PTSD. Neither age, gender, educational level nor exposure to wounded or dead patients were associated with increased risk of probable PTSD (Maguen et al., 2008; Grieger et al., 2007). Among soldiers who served in combat environments risk factors for increased PTSD symptoms included lower post-deployment social support and lower unit support (Pietrzak et al., 2010). In a study involving over 22,000 Army soldiers during a 12 month deployment in Iraq, duration of deployment was associated with increased stress problems but not with sustained or substantial increase in mental health casualties (Warner et al., 2007). Meta-analysis not specific to military or to medical workers conclude that the following are risk factors for PTSD: history of mental illness, personal injury, living through dangerous events and traumas, seeing others injured or killed; feeling horror, helplessness, or extreme fear; having little or no social support after the event; and dealing with extra stress after the event, such as loss of a job, home or loved one (Brewin, Andrews, & Valentine, 2000).

From a broad based targeted population standpoint, future strategies aimed at preventing PTSD among populations of military health care workers may be more successful if they implement programs that promote routine vigorous physical activity. When accomplished together as a team, the added benefit of increased unit cohesion among military health care workers will also have a protective effect against PTSD. Since targeted population pre-deployment training has not been shown to be effective, consideration should therefore be given to enhancing the content of such training, while ensuring routine longer term regularly scheduled vigorous unit physical training for military health care workers, especially prior to deployment to combat settings. This is important to emphasize as all too often in the health care field, time for physical exercise is prone to being placed at a lower priority. Military medical leaders armed with the knowledge that both physical exercise and strong unit cohesion are protective against PTSD will have greater credibility and a stronger case for successfully implementing mandatory group physical training programs among their military health care workers, ensuring its part in the routine of the work day.

Modified Prolonged Exposure therapy offers unique applicability to military in austere settings. Although additional research is necessary, its translation into primary care settings, as well as its initial success, show promise for an effective and practical early intervention strategy that may be adopted in efforts to prevent PTSD among military health care providers.

More research is needed on PTSD prevention among military health care workers. Large scale prospective studies specific to combat medics, for example, are currently underway. The preliminary objectives of one such study—to assess the pre-existing behavioral health issues of combat medics and determine pre-existing risk factors to psychological resiliency and pre-existing protective factors of psychological resiliency—are encouraging (Maiers et al., 2011).

Scales used to measure resilience continue to evolve and numerous variations exist. Military publications acknowledge the lack of a 'gold standard' method for resiliency testing, but not uncommonly advocate or utilize the Connor-Davidson Resilience Scale (CD-RISC), the Response to Stressful Experiences Scale (RSES), Disposition Resilience Scale (DRS-15), and designed specifically for post-deployment testing, the Deployment Risk and Resilience Inventory (DRRI) (Watson, Litz, Southwick, & Ritchie, 2011; Maiers, Mayer, Baker, Escolas, & Chapman, 2011; Ballenger-Browning & Johnson, 2009; Maguen et al., 2008). In a review and comparative assessment of resilience measurement scales applicable to civilian populations, the authors concluded that they were unable to find a current 'gold-standard' among 15 separate resilience measurement scales; but that overall the CD-RISC, the Resilience Scale for Adults (RSA), and the Brief Resilience Scale received the highest ratings, and the DRS-15 well-ranked for fixed-trait resiliency testing (Windle, Bennett, & Noyes, 2011). Of note, Windle et al. (2011) did not include either the RSES or the DRRI in their assessment, perhaps due to the reviewers' background orientation to resiliency among civilian populations with emphasis on healthy aging (Windle et al., 2011).

The CD-RISC is a 25-item scale with total score ranging from 0 to 100, with higher scores indicating greater resilience; and validation of factors of personal competence, trust in one's instincts or tolerance of negative effects, positive acceptance of change, and control and spiritual influences (Ballenger-Browning, & Johnson, 2009; Connor & Davidson, 2003). Among soldiers who served in combat operations, those without PTSD had significantly higher resilience scores on all CD-RISC subscales, with the exception of spiritual influence which was not significant, compared to those with PTSD (Pietrzak et al., 2010).

The RSES is a 22-item scale initially validated exclusively in an active-duty and military reserve sample. Totals scores range from 0 to 88, and higher scores signify greater resilience. The RSES includes factors of positive appraisal, spirituality, active coping, self-efficacy, meaning/learning and acceptance of limits (Watson et al., 2011; Ballenger-Browning, & Johnson, 2009).

Modifications to the Dispositional Resilience Scale (DRS), developed over twenty years ago, have yielded a shorter 15-item hardiness scale (DRS-15) with the advantage of brevity, good internal and external validity, test-retest reliability of 0.78; as well as maintenance of reliability, validity, and cultural appropriateness among translated versions (Bartone, 2007; Hystad, Eid, Johnsen, Laberg, & Bartone, 2010). It is designed to measure psychological hardiness (commitment, control, and challenge); as regarded as a fixed trait; and has been used effectively to predict success among U.S. Army Special Forces candidates (Bartone, Roland, Picano, & Williams, 2008; Windle et al., 2011).

Increased large scale collaborative research that spans across all branches of military service are also encouraged, given the diverse roles that each service may assume in regards to trauma medical care and potential exposures. Such research will add to the foundation of identified significant resiliency factors and allow for efficient integration of screening and training programs intended to prevent PTSD among all military branches of medical personnel.

Once the factors that lend to protective resiliency specific to this population are identified, prospective randomized controlled trials may be conducted that implement those resiliency factors among dedicated training programs, or perhaps as screening criteria for such professions, and the outcomes would likely prove invaluable. Research that harnesses the coping styles of especially resilient personnel may offer ways of teaching those skills to others. Improved knowledge of the elements related to mental resilience can lead to enhanced training and clinical programs that optimize protective factors among military medical personnel; not only in day-to-day operations, but particularly before, during, and after combat deployments when stressors and potential traumatic exposures are at their highest.

Conclusion

Significant variation exists among PTSD preventive strategies in effectiveness and in applicability to the military healthcare worker. While current evidence is lacking for a single strategy that is efficacious in the prevention of PTSD among this population; improved awareness of factors associated with risk and with mental resiliency, combined with enhanced understanding and early appropriate implementation of effective interventions, may optimize PTSD prevention at both the individual and at the broad-reach population-based level for this at-risk group of personnel. Further research is needed for this common force health protection concern.

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